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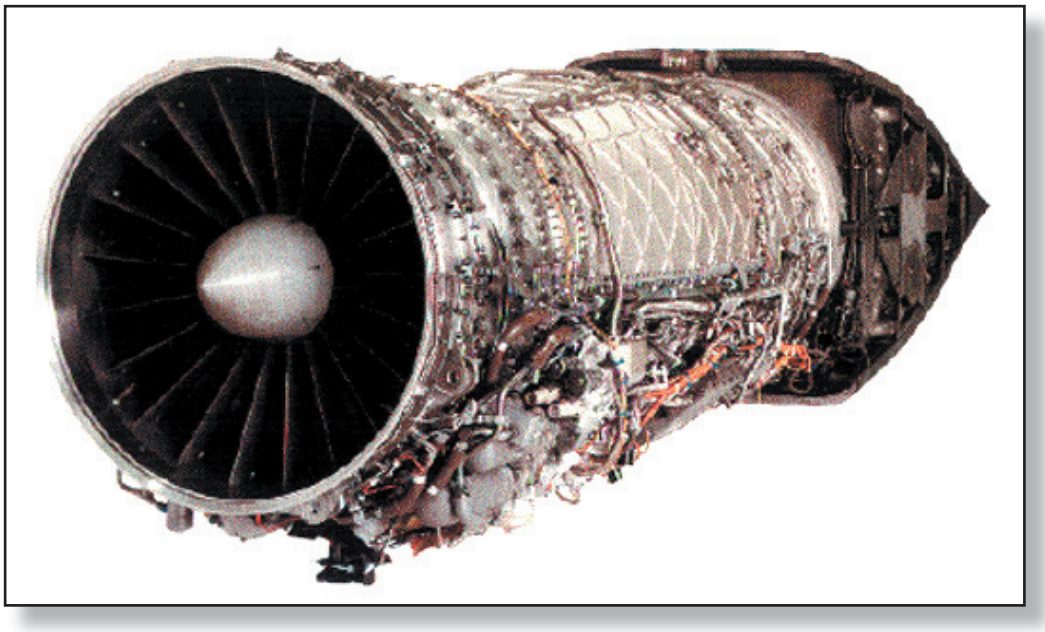
Science and Technology for Tomorrow's Air and Space Force

Success Story

REVOLUTIONARY ANALYSIS CONDUCTED ON F119 ENGINE



The Propulsion Directorate's Structures and Controls Branch successfully used advanced probabilistic analysis to quantify and assess variations in engine structural behavior. Probabilistic design approaches are rapidly being integrated into engine design and development processes to assure that optimum structural efficiencies and durability requirements are achieved.

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Accomplishment

The directorate utilized advanced probabilistic analysis to quantify variations in the F119 engine's structural behavior. The analysis predicted engine structural behavior over a large region of design space and defined the test results with greater accuracy than conventional analysis methods.

The test results found significant variations in the dynamic behavior of the engine structure that were caused by manufacturing variations in geometry. By accounting for this variation during test data processing, engineers will be able to reduce measurement errors and provide a more accurate determination of component behavior and a component predicted service life assessment.

Background

The probabilistics analysis of the F119 engine structure is part of the Integrated High Performance Turbine Engine Technology (IHPTET) program. The directorate coordinated the analysis approach and findings with Pratt & Whitney test engineers to allow probabilistic analysis to be applied to future design processes.

Propulsion
Emerging Technologies

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (04-PR-18)